

Amendments to the Drawings

Please replace FIGs. 1, 2 and 5 with the attached amended FIGs. 1, 2 and 5.

Remarks

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1-7, 9-20, and 22-28 are pending in the application, with claims 1 and 17 being the independent claims. Claims 8 and 21 are sought to be cancelled without prejudice to or disclaimer of the subject matter therein. No new claims are sought to be added. Claims 1, 9, 13, 15, 17, 25 and 27 are sought to be amended. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicant respectfully requests that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Objections to the Drawings

The Examiner has objected to FIGs. 1, 2 and 5. Amended FIGs. 1, 2, and 5, correct directional arrows, as requested by the Examiner. Applicant respectfully request withdrawal of the drawing objections.

Objections to the Claims

The Examiner has objected to claim 1 because there is a grammatical error in line 7 of the claim. For purposes of examination the Examiner interprets that scan tests are conducted "on" not "of" the plurality of scan paths. Claim 1, line 7 has been amended herein to replace the use of the word "of" with "on." Applicant respectfully requests withdrawal of this objection.

The Examiner has objected to claim 1 because in step (e) it is unclear to the Examiner what is being traced in the instance wherein a "good scan path" outputs the number of errors indicative of no errors (i.e., zero). Applicant refers the Examiner to ¶ 45 of the application, which describes generally what is being traced. In the specific instance, albeit unlikely, when there are no errors on the good scan paths only the errors associated with the bad scan path would be traced. Applicant respectfully requests withdrawal of this objection.

The Examiner has objected to claim 1 because in step (f) it is unclear to the Examiner how the "good scan paths" provide any information relevant to the shifting of the segment point and returning to step (b) to additionally segment the single identified bad scan path already segmented into two segments. The Applicant refers the Examiner to ¶ 42-43 of the application, which describes how the good scan paths are used to determine the segmentation point. Applicant respectfully requests withdrawal of this objection.

The Examiner has objected to claims 8 and 21 because it is unclear to the Examiner how the two segments are equal in size after step (b) and (c) ("i" in this examination) respectively wherein the segment point has been shifted and there is a return to the segmentation step (b) and (c) ("i" in this examination) respectively. Applicant assumes the Examiner is referring to claims 8 and 21, since claim 20 does not deal with dividing the segment into two segments and claim 21 does. Claim 8 and 21 have been cancelled, rendering this objection moot.

The Examiner has objected to claims 10 and 22 because it is unclear to the Examiner what applicant is referring to when incorporating "a coupled error source" in line 4 of the claim. A coupled error source is an error source that propagates an error into another point. For example, an error will either originate in a flip-flop because of a problem with that particular flip-flop or an error will be produced in a flip-flop because of a problem in a flip-flop that precedes the flip-flop being considered. In the later situation the original flip-flop generating an error is referred to as a "coupled error source." Applicant respectfully requests withdrawal of this objection.

The Examiner has objected to claims 13-16 and 25-28 because it is unclear to the Examiner which "end" or "beginning" the Applicant is referring to when establishing a location for the segment point. The Examiner notes that a scan chain has two defined ends or two beginnings. Applicants clarify that the beginning refers to the point where a test signal is input, and the end refers to the point where a test signal is output. Applicant respectfully requests withdrawal of this objection.

The Examiner has objected to claim 17 because there is a grammatical error in line 8 of the claim. For purposes of examination the Examiner interprets that scan tests are conducted "on" not "of" the plurality of scan paths. Claim 1, line 8 has been amended herein to replace the use of the word "of" with "on." Applicant respectfully requests withdrawal of this objection.

The Examiner has objected to claim 17 because in step (e) it is unclear to the Examiner what is being traced in the instance wherein a "good scan path" outputs the number of errors indicative of no errors (i.e., zero). Applicant refers the Examiner to ¶ 45 of the application, which describes generally what is being traced. In the specific instance, albeit unlikely, when there are no errors on the good scan paths only the errors associated with the bad scan path would be traced. Applicant respectfully requests withdrawal of this objection.

The Examiner has objected to claim 17 because in step (g) it is unclear to the Examiner how the "good scan paths" provide any information relevant to the shifting of the segment point and returning to step (c) to additionally segment the single identified bad scan path already segmented into two segments. The Applicant refers the Examiner to ¶ 42-43 of the application, which describes how the good scan paths are used to determine the segmentation point. Applicant respectfully requests withdrawal of this objection.

Rejections under 35 U.S.C. § 112

The Examiner has rejected claims 1-28 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point and distinctly claim the subject matter which Applicant regards as the invention. Specifically, the Examiner notes that there is not proper antecedent basis for the limitation "the bad scan path and good scan paths" in that there was no previous reference to good scan paths. Independent claims 1 and 17 have been amended to provide an appropriate reference for good scan paths. Applicants respectfully request withdrawal of this rejection.

The Examiner has rejected claim 1 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point and distinctly claim the subject matter which Applicant regards as the invention. Specifically, the Examiner acknowledges that the Applicant segments the identified bad scan path. The Examiner notes that the segmentations serve no purpose in the invention as it has been claimed since only the scan paths in their entirety are examined thereafter. Applicants have amended claim 1 to clarify the role of the segmentation. Applicants respectfully request withdrawal of this rejection.

The Examiner has indicated that claim 2 may not be further considered on its merits since the Examiner interprets that it only pertains to the "good scan paths" not yet established. Claim 1 has been amended to clarify the antecedent basis for "good scan paths." Applicants respectfully request consideration of claim 2.

The Examiner notes that there is not proper antecedent basis for the limitation "the bad scan path and good scan paths" in claim 17 in that there was no previous reference to good scan paths. Independent claim 17 have been amended to provide an appropriate reference for good scan paths. Applicants respectfully request withdrawal of this rejection.

The Examiner has rejected claim 17 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point and distinctly claim the subject matter which Applicant regards as the invention. Specifically, the Examiner

acknowledges that the Applicant segments the identified bad scan path. Examiner notes that the segmentations serve no purpose in the invention as it has been claimed since only the scan paths in their entirety are examined thereafter. Applicants have amended claim 17 to clarify the role of the segmentation. Applicants respectfully request withdrawal of this rejection.

The Examiner has rejected claim 17 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point and distinctly claim the subject matter which Applicant regards as the invention. Specifically, the Examiner identifies that the Applicant has not indicated the step that the method returns to in step (g). Applicants have amended claim 17 to clarify that step(g) returns the method to step (b). Applicants respectfully request withdrawal of this rejection.

Rejections under 35 U.S.C. § 102

Claims 1-4, 10-20, and 22-28 have been rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Application 2003/0208710 ("Martin-de-Nicolas Patent Application"). Applicants respectfully traverse.

The Martin-de-Nicolas Application provides a method of testing an electrical component, such as a microprocessor. The method performs a test segment for N cycles on a known device that performs the test segment successfully and on a device-under-test ("DUT") that performs the test segment unsuccessfully. The expected results of the known device are compared against the actual results of the DUT. The adjustment of N is performed iteratively until the failing instruction is identified.

Martin-de-Nicolas Application at ¶ 9. Example DUTs are microprocessors or the like.

Id. at ¶15. A test segment comprises one or more instructions, memory, register values, and/or the like. *Id.* at ¶18.

Claims 1 and 17 contrast significantly to the invention disclosed in the Martin-de-Nicolas Application. Specifically, claims 1 and 17 focuses on individual scan paths that include flip-flops being tested and not sophisticated devices, such as microprocessors. Furthermore, in the present application, the test cycles are not changed rather the number of individual flip-flops with a scan path being considered is adjusted. Finally, claims 1 and 17 focus on a series of flip-flops, not a series of program instructions. These significant differences underscore the inappropriateness of using the Martin-de-Nicolas Application to reject independent claims 1 and 17 under 35 U.S.C. § 102(e).

Specifically, the Martin-de-Nicolas Application does not teach, disclose or suggest the element of:

- (f) shifting the segment point based on an analysis of the errors generated by the bad scan path and the good scan paths and returning to step (b) when the number of errors of an output of the bad scan path are greater than a bad path error threshold or the number of errors on an output of any one of the good scan paths is greater than a good path error threshold.

This element is recited in claim 1 with a similar feature recited in claim 17.

The reliance on paragraphs 28, 29 and 31, which were identified by the Examiner to support the Examiner's contention that the Martin-de-Nicolas Application teaches this element is misplaced. These paragraphs disclose reducing the number of instructions transmitted to a microprocessor when there is a test error to help determine what instruction is causing the error. This differs significantly from the element above. In the above element, a segment point, which shifts the number of flip-flops being

examined in a scan test, is moved in an attempt to isolate which flip-flop(s) is causing an error, not which instruction is the source of an error.

Furthermore, in the above element, results from both bad and good scan paths are assessed to shift the segment point. On the other hand, the Martin-de-Nicolas Application discloses only examining the results of a bad DUT to reduce the number of instructions being sent to the DUT under test. Thus, even ignoring the fact that the DUT under test in the Martin-de-Nicolas Application is very different from segments and that instructions are not what are being manipulated, the approach in the Martin-de-Nicolas Application is still quite different from the approach in claims 1 and 17. For at least these reasons, independent claim 1 and independent claim 17, are patentable over the Martin-de-Nicolas Application. The Applicant respectfully requests reconsideration and allowance of claims 1 and 17.

Because each dependent claim incorporates all of the elements of the independent claim from which it depends, as well as additional features, the above arguments apply a fortiori to the dependent claims. Thus, claims 2-16, which depend on claim 1 and claims 18-28, which depend on claim 17, are also patentable over the Martin-de-Nicolas Application. Reconsideration and allowance of claims 2-16 and 18-28 is respectfully requested.

Rejections under 35 U.S.C. § 103

Claims 5-7 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application 2003/0208710 ("Martin-de-Nicolas Patent Application") in view of Applicant Admitted Prior Art (AAPA). Applicants respectfully traverse.

As discussed above the Martin-de-Nicolas Application does not teach, disclose or suggest the element of independent claim 1 of:

- (f) shifting the segment point based on an analysis of the errors generated by the bad scan path and the good scan paths and returning to step (b) when the number of errors of an output of the bad scan path are greater than a bad path error threshold or the number of errors on an output of any one of the good scan paths is greater than a good path error threshold.

The alleged Applicant Admitted Prior Art only deals with temperature variation and does not disclose or suggest this element. For at least this reason claims 5-7, which depend on claim 1 are allowable over the Martin-de-Nicolas Application. Reconsideration and allowance is respectfully requested.

Claims 8 and 21 have been rejected under 35 U.S.C. § 102(e) as being unpatentable over U.S. Patent Application 2003/0208710 ("Martin-de-Nicolas Patent Application") in view of U.S. Patent 6,978,416 ("Widmer Patent"). Applicants respectfully traverse.

Claims 8 and 21 have been cancelled rendering this rejection as moot.

Claim 9 has been rejected under 35 U.S.C. § 102(e) as being unpatentable over U.S. Patent Application 2003/0208710 ("Martin-de-Nicolas Patent Application") in view of either U.S. Patent 5,541,940 ("Akita Patent") or U.S. Patent 6,999,386 ("Sugimoto Patent"). Applicants respectfully traverse.

As discussed above the Martin-de-Nicolas Application does not teach, disclose or suggest the element of independent claim 1 of:

- (f) shifting the segment point based on an analysis of the errors generated by the bad scan path and the good scan paths and returning to step (b) when the number of errors of an output of the bad scan path are greater than a bad

path error threshold or the number of errors on an output of any one of the good scan paths is greater than a good path error threshold.

Neither the Akita Patent or Sugimoto Patent disclose or suggest this element, and do not remedy the shortcomings of the Martin-de-Nicolas Application, which teaches a method that conflicts with that of the present application. For at least this reason claim 9, which depends on claim 1, is allowable over the Martin-de-Nicolas Application. Reconsideration and allowance is respectfully requested.

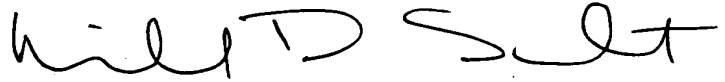
Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicant believes that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is
respectfully requested.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

A handwritten signature in black ink, appearing to read "Michael D. Specht".

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